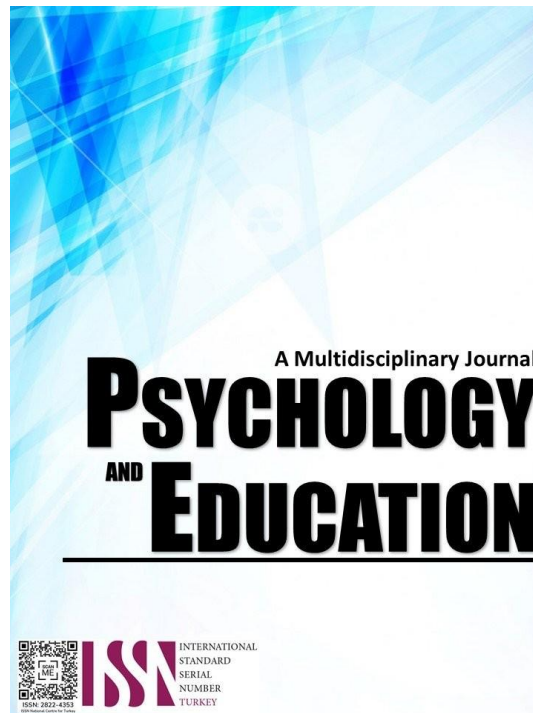


ASSESSING HEALTH-RELATED PHYSICAL FITNESS AMONG FILIPINO JUNIOR HIGH SCHOOL STUDENTS: IMPLICATIONS FOR TAILORED FITNESS PROGRAMS



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Assessing Health-Related Physical Fitness among Filipino Junior High School Students: Implications for Tailored Fitness Programs

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Abstract

This study assessed the health-related physical fitness among junior high school students in a private academic institution in Bacolod City, Philippines. Focusing on cardiovascular endurance, muscular strength, muscular endurance, body composition, and flexibility, the research aimed to determine fitness levels across different groups by sex and lifestyle (athlete vs. non-athlete). Using a descriptive-normative research design, 160 students were evaluated through practical fitness tests based on the Revised Physical Fitness Tests (PFT) Manual of the Department of Education (2019). Results indicated high cardiovascular endurance and muscular strength among students, with average muscular endurance and flexibility, and normal body composition. Significant differences were observed, with females showing higher muscular strength and males exhibiting better cardiovascular and muscular endurance. Athletes demonstrated higher muscular strength and leaner body composition compared to non-athletes. These findings underscore the importance of tailored physical education programs to address specific fitness components and promote overall health. A comprehensive fitness program is proposed, including regular aerobic activities for cardiovascular endurance, resistance training for muscular strength, circuit training for muscular endurance, flexibility exercises, and nutritional guidance to maintain healthy body composition. The study aligns with global and regional literature emphasizing the role of structured physical activity programs in enhancing adolescent health and well-being. These results highlight the need for inclusive and effective physical education programs to foster lifelong fitness habits among junior high school students.

Keywords: *Health-related physical fitness, cardiovascular endurance, muscular strength, muscular endurance, body composition*

Introduction

Understanding the distinction between physical education and physical activity is crucial in today's context. Physical education encompasses structured instructional programs designed to promote physical fitness and is vital for guiding students to become informed consumers of physical activity (World Health Organization, 2020; Centers for Disease Control and Prevention, 2021).

Physical fitness, a key objective of physical education programs, is essential for individuals' healthy growth and development. Key components of physical fitness include cardiovascular endurance, muscular strength, muscular endurance, body composition, and flexibility. These elements are crucial as they contribute to overall health and the ability to perform daily tasks efficiently (US Department of Health and Human Services, 2018). Additionally, factors such as gender and lifestyle (athlete vs. non-athlete) influence these fitness levels, necessitating a comprehensive evaluation (Ortega et al., 2008).

Globally, studies have highlighted the importance of physical fitness during childhood and adolescence. Telama et al. (2014) demonstrated that early engagement in physical fitness leads to long-term health benefits and sustained physical activity in adulthood. Schmidt et al. (2020) found that active children and adolescents are more likely to maintain an active lifestyle and achieve higher productivity in adulthood. Furthermore, a study by Trudeau and Shephard (2008) emphasized that comprehensive school-based physical activity programs significantly improve children's health outcomes worldwide. These studies underscore the need for effective physical education programs that promote lifelong fitness habits.

In the ASEAN region, studies have shown similar trends. For example, a study in Malaysia found that school-based physical activity programs significantly improved students' physical fitness levels (Rengasamy, 2012). In Indonesia, Adi (2023) reported that integrating physical education into the school curriculum enhances students' overall fitness and academic performance. In the Philippines, research by Pituk and Cagas (2019) indicated that integrating comprehensive fitness programs in schools improved student health outcomes and academic performance. Additionally, Cagas et al. (2022) highlighted the positive impact of regular physical activity on the mental health of Filipino adolescents.

Despite the substantial body of research on the benefits of physical fitness, there remains a notable gap in the literature specifically addressing the health-related physical fitness levels among junior high school students in the ASEAN region, particularly in the Philippines. While existing studies have explored the general impacts of physical education and fitness programs, few have delved into the specific health-related fitness components among this demographic. Understanding these fitness levels is crucial for developing tailored physical education curricula that address the unique needs of junior high school students.

This study aimed to fill this gap by providing a comprehensive evaluation of the health-related physical fitness levels among junior

high school students in the Philippines. By doing so, it sought to inform and enhance physical education programs at the high school level, ensuring they are effective in promoting lifelong fitness habits and addressing the specific health needs of Filipino adolescents. The findings of this study may be instrumental in guiding educators, policymakers, and stakeholders in the development of targeted interventions and strategies to improve student health outcomes through optimized physical education programs.

Research Questions

The main purpose of this study was to assess the level of health-related physical fitness among junior high school students in a private academic institution in Bacolod City, Philippines. The salient findings served as the basis for developing a physical fitness program for the students. Specifically, the researchers sought to answer the following questions:

1. What is the level of health-related physical fitness among junior high school students when grouped by sex, lifestyle (athlete and non-athlete), and as a whole, in the following components: a) cardiovascular endurance, b) muscular strength, c) muscular endurance, d) body composition, and e) flexibility?
2. Is there a significant difference in the level of health-related physical fitness among junior high school students when grouped by sex, and lifestyle (athlete and non-athlete), in the following components: a) cardiovascular endurance, b) muscular strength, c) muscular endurance, d) body composition, and e) flexibility?
3. What fitness program could be developed based on the salient findings of the study?

Literature Review

Cardiovascular Endurance in Adolescents

Cardiovascular endurance is a crucial component of physical fitness, reflecting the efficiency of the heart, lungs, and vascular system in delivering oxygen to the muscles during prolonged physical activity. Research has consistently highlighted its importance in overall health. Guthold et al. (2020) stated that insufficient physical activity is a global concern, significantly affecting cardiovascular health in adolescents. This finding is supported by Janssen and LeBlanc (2010), who noted that physical inactivity during childhood contributes to long-term health risks.

Globally, research by Telama et al. (2014) demonstrated that children and adolescents with higher levels of cardiovascular endurance are more likely to maintain an active lifestyle and achieve higher productivity in adulthood. These studies collectively underscore the necessity of promoting cardiovascular endurance through school-based physical education programs to foster long-term health benefits.

In the ASEAN region, a study in Malaysia found that implementing structured physical activity programs in schools significantly improved students' cardiovascular endurance (Rengasamy, 2012). Similarly, Chia and Teck (2019) reported enhancements in cardiovascular fitness among Singaporean students who participated in integrated physical education programs. In the Philippines, research by Lacasan and Lacasan-Nagba (2023) observed that comprehensive fitness programs in schools improved physical health and boosted academic performance, indicating a strong link between cardiovascular endurance and overall student well-being.

Muscular Strength and Endurance

Muscular strength and endurance are critical for performing daily tasks efficiently and reducing the risk of injury. Studies have shown that these components of physical fitness are vital for overall health and functional ability. According to Dahab and McCambridge (2009), regular participation in strength training exercises significantly enhances muscular strength and endurance among students. This improvement in muscular fitness is essential for their growth and development.

Agarwal (2020) emphasized the role of physical education teachers in promoting activities that build muscular strength and endurance, highlighting the need for structured programs that focus on these fitness components. In a global context, Lloyd et al. (2014) noted that school-based programs that include strength training exercises lead to significant improvements in students' muscular fitness levels.

Regionally, a study by Pichardo et al. (2019) in New Zealand found that integrating strength training into the school curriculum enhanced muscular strength and endurance among students. In the Philippines, Pituk and Cagas (2019) highlighted the positive impact of regular physical activity on adolescents' physical and mental health, particularly through activities that improve muscular fitness.

Body Composition in Adolescents

Body composition, which refers to the proportion of fat and non-fat mass in the body, is a critical indicator of health. Research has shown that maintaining a healthy body composition prevents chronic diseases and promotes overall well-being. Hao (2021) noted that physical education programs aimed at improving body composition can significantly enhance students' health outcomes.

Globally, Sallis et al. (2016) found that comprehensive physical activity programs in schools lead to favorable changes in body composition, reducing the risk of obesity and related health issues. Telama et al. (2014) emphasized that active children are more likely to maintain a healthy body composition into adulthood, underscoring the long-term benefits of early physical fitness interventions.

In the ASEAN region, Rizal et al. (2019) observed that school-based fitness programs effectively improved students' body composition, promoting healthier lifestyles. Cruz et al. (2021) reported similar findings in the Philippines, indicating that comprehensive school

fitness programs contribute to better body composition and overall health among students.

Flexibility and Its Importance

Flexibility is essential to physical fitness, enabling individuals to perform movements with a full range of motion. Studies have highlighted the importance of flexibility in preventing injuries and improving overall physical performance. Chaouachi et al. (2014) emphasized the need for physical education programs, including flexibility training, to enhance students' physical fitness and reduce the risk of musculoskeletal injuries.

Globally, Faigenbaum et al. (2010) found that school-based physical activity programs that incorporate flexibility exercises significantly improve students' flexibility levels. This finding is supported by Lloyd et al. (2014), who noted that flexibility training is crucial for maintaining physical function and preventing injuries throughout life.

In the ASEAN region, Setyawan et al. (2022) reported that integrating flexibility exercises into the school curriculum in Indonesia resulted in improved flexibility among students, enhancing their overall physical fitness. In the Philippines, Pituk and Cagas (2019) highlighted the positive impact of regular physical activity, including flexibility training, on adolescents' physical and mental health.

Gender and Lifestyle Differences in Physical Fitness

Research has shown that gender and lifestyle factors significantly influence physical fitness levels among adolescents. Lacy et al. (2012) noted that male and female students often exhibit different levels of physical fitness, necessitating tailored fitness programs to address these differences. Additionally, lifestyle factors such as being an athlete or non-athlete play a crucial role in determining fitness levels.

Globally, Telama et al. (2014) found that active children and adolescents are more likely to maintain higher physical fitness levels, regardless of gender. However, the study also highlighted the need for gender-specific interventions to address unique fitness needs. Sallis et al. (2016) emphasized the importance of considering lifestyle factors when designing school-based fitness programs, as athletes often require different training regimens than non-athletes.

In the ASEAN region, Wong et al. (2016) observed that school-based fitness programs in Malaysia need to account for gender differences to be effective. Similarly, Setyawan et al. (2022) reported that tailored fitness programs considering gender and lifestyle factors significantly improve students' physical fitness levels in Indonesia. In the Philippines, Cagas et al. (2022) highlighted the importance of designing fitness programs that address the specific needs of male and female students and athletes and non-athletes to maximize health outcomes.

Synthesis

The literature consistently underscores the critical role of school-based physical education programs in enhancing various aspects of physical fitness among adolescents. Key components such as cardiovascular endurance, muscular strength, body composition, and flexibility contribute significantly to overall health. Studies globally and in the ASEAN region demonstrate the effectiveness of structured physical activity programs in improving these fitness components. Additionally, addressing gender and lifestyle differences in these programs ensures broader benefits. This synthesis establishes a strong foundation for assessing and enhancing health-related physical fitness among junior high school students in the Philippines, aiming to develop a targeted enrichment program promoting lifelong health and well-being.

Methodology

Research Design

Descriptive-normative research design was employed to assess the level of health-related physical fitness among 160 junior high school students in a private academic institution in Bacolod City, Philippines, selected through stratified random sampling. This method involves surveying and observing a sample to describe the characteristics of a population, with the normative aspect aiming to establish what is typical or standard within the population being studied (Creswell & Creswell, 2018).

Instruments

The researchers gave actual practical tests on the five components of physical fitness, namely cardiovascular (1,000-meter run and walk), muscular strength tests (standing long jump and 30-second curl-ups), muscular endurance (50-meter sprint), body composition (body mass index) and flexibility (sit and reach). An information sheet indicating the respondents' sex (male or female) and lifestyle (athlete or non-athlete) was also provided. The tests and the standard norm of scores were based on the Revised Physical Fitness Tests (PFT) Manual of the Department of Education (2019).

Procedure

The researchers obtained formal approval from the Vice President for Academics and Research and the principal to conduct the study within the university. Once approval was granted, the researchers communicated the study's objectives and the schedule of tests to the

Physical Education (PE) teachers. During the data gathering, the researchers collaborated with the teachers to administer the tests to the junior high school students, with the assistance of the school physician to ensure the health and safety of the respondents. Results were promptly collected, and the data were then encoded, tabulated, analyzed, and interpreted by the researchers. This process aimed to address the research questions comprehensively and generate valid conclusions.

Data Analysis

For research question number 1, which aimed to assess the level of health-related physical fitness among junior high school students when grouped by sex, lifestyle (athlete and non-athlete), and as a whole, in the components of cardiovascular endurance, muscular strength, muscular endurance, body composition, and flexibility, descriptive data analyses were conducted. Specifically, the mean ($\bar{x}$) and standard deviation (SD) were calculated to summarize the central tendency and dispersion of the fitness levels within each group. These measures were chosen because they provide a clear and concise summary of the data, highlighting the average performance and variability within each group.

For research question number 2, which aimed to determine if there is a significant difference in the level of health-related physical fitness among junior high school students when grouped by sex and lifestyle (athlete and non-athlete), in the same components, inferential data analysis was applied using the Independent Samples t-test. This statistical method was chosen because it allows for the comparison of means between two independent groups, providing insights into whether the observed differences are statistically significant. The Independent Samples t-test was chosen for comparing differences between two groups (males vs. females; athletes vs. non-athletes) because the sample size was sufficiently large and the data were normally distributed.

Ethical Considerations

The researcher upheld key ethical principles to ensure the integrity of the study. In obtaining parental consent, the researcher clearly explained the study's rationale and objectives to the parents or guardians of the respondents, who were minors. Parents were assured that their child's academic standing would not be impacted. Participation was voluntary, with respondents given the option to withdraw at any time through their parents or guardians. Parents could choose whether to include their child's full name in the information sheet to protect anonymity. The researcher emphasized the protection and secure storage of both electronic data and printed materials to maintain confidentiality. After the required retention period, all data were appropriately disposed of to meet ethical standards, including the deletion of tangible data sources and survey questionnaires from the online platform, ensuring no possibility of retrieval. All data collected were used solely for this study. The researchers committed to not disclosing any respondent information under any circumstances, thereby preserving the confidentiality and integrity of the data.

Results and Discussion

This section presents and interprets data from the study using descriptive and inferential statistics. Findings are shown in narrative form with supporting tables. The discussion includes implications and integrates related studies for a comprehensive understanding.

Level of Health-Related Physical Fitness Among Junior High School Students

Table 1 presents the level of health-related physical fitness among junior high school students in cardiovascular endurance. The overall level of cardiovascular endurance ($\bar{x}$ =9.59, SD=1.29) is interpreted as high. Both male ($\bar{x}$ =10.08, SD=1.05) and female ($\bar{x}$ =9.01, SD=1.31) students, as well as athletes ($\bar{x}$ =9.33, SD=1.27) and non-athletes ($\bar{x}$ =9.64, SD=1.29), demonstrate high levels of cardiovascular endurance. These findings align with Telama et al. (2014) and Lacasan and Lacasan-Nagba (2023), who highlighted the importance of cardiovascular fitness for long-term health and academic performance. The high cardiovascular endurance across sexes and lifestyles suggests the effectiveness of current physical education programs in promoting cardiovascular health among all students (Schmidt et al., 2020; Rengasamy, 2012).

Table 1. *Level of Health-Related Physical Fitness Among Junior High School Students in Cardiovascular Endurance*

Variables	$\bar{x}$	SD	Interpretation
Sex			
Male	10.08	1.05	High
Female	9.01	1.31	High
Lifestyle			
Athlete	9.33	1.27	High
Non-Athlete	9.64	1.29	High
Total	9.59	1.29	High

Table 2 presents the level of health-related physical fitness among junior high school students in muscular strength. The overall level of muscular strength ($\bar{x}$ =12.79, SD=4.15) is very high. Male students ($\bar{x}$ =10.21, SD=2.91) demonstrate a high level of muscular strength, while female students ($\bar{x}$ =15.79, SD=3.26) exhibit a very high level. Non-athlete ($\bar{x}$ =12.49, SD=4.08) and athlete ($\bar{x}$ =14.42, SD=4.22) students display very high levels of muscular strength. These findings are consistent with Agarwal (2020), who emphasized the importance of strength training in physical education. The higher muscular strength in female students contrasts with typical

expectations, suggesting a need for further investigation into activity preferences and training routines. The significant levels of muscular strength among both athletes and non-athletes underscore the effectiveness of physical education programs in promoting muscular fitness (Dahab & McCambridge, 2009).

Table 2. Level of Health-Related Physical Fitness Among Junior High School Students in Muscular Strength

Variables	$\bar{x}$	SD	Interpretation
Sex			
Male	10.21	2.91	High
Female	15.79	3.26	Very High
Lifestyle			
Non-Athlete	12.49	4.08	Very High
Athlete	14.42	4.22	Very High
Total	12.79	4.15	Very High

Table 3 presents the level of health-related physical fitness among junior high school students in muscular endurance. The overall level of muscular endurance ($\bar{x}=7.81$, $SD=1.17$) is average. Both male ($\bar{x}=8.50$, $SD=0.76$) and female ($\bar{x}=7.01$, $SD=1.05$) students, as well as athletes ($\bar{x}=7.61$, $SD=1.03$) and non-athletes ($\bar{x}=7.84$, $SD=1.19$), demonstrate average levels of muscular endurance. These findings align with Dahab and McCambridge (2009), who noted that regular participation in endurance activities improves muscular endurance. The slight differences between sexes and lifestyles suggest potential areas for further targeted interventions to enhance endurance levels. The average levels of muscular endurance indicate a need for enhanced training programs to improve this component of physical fitness among junior high school students.

Table 3. Level of Health-Related Physical Fitness Among Junior High School Students in Muscular Endurance

Variables	$\bar{x}$	SD	Interpretation
Sex			
Male	8.50	0.76	Average
Female	7.01	1.05	Average
Lifestyle			
Athlete	7.61	1.03	Average
Non-Athlete	7.84	1.19	Average
Total	7.81	1.17	Average

Table 4 presents the level of health-related physical fitness among junior high school students in body composition. The overall level of body composition ($\bar{x}=22.50$, $SD=2.50$) is interpreted as normal. Both male ($\bar{x}=22.00$, $SD=2.00$) and female ($\bar{x}=21.50$, $SD=2.50$) students, as well as athletes ($\bar{x}=21.00$, $SD=2.00$) and non-athletes ($\bar{x}=23.00$, $SD=2.80$), exhibit normal body composition. These findings are consistent with research by Sallis et al. (2016), which highlighted the importance of physical activity programs in maintaining healthy body composition. The normal body composition across all groups indicates effective physical education programs that promote healthy weight and fat distribution among students. However, the slight variations suggest that athletes tend to have a leaner body composition, likely due to regular physical activity and structured training routines (Rizal et al., 2019).

Table 4. Level of Health-Related Physical Fitness Among Junior High School Students in Body Composition

Variables	$\bar{x}$	SD	Interpretation
Sex			
Male	22.00	2.00	Normal
Female	21.50	2.50	Normal
Lifestyle			
Athlete	21.00	2.00	Normal
Non-Athlete	23.00	2.80	Normal
Total	22.50	2.50	Normal

Table 5. Level of Health-Related Physical Fitness Among Junior High School Students in Flexibility

Variables	$\bar{x}$	SD	Interpretation
Sex			
Male	7.87	0.92	Average
Female	7.36	0.88	Average
Lifestyle			
Athlete	7.73	0.93	Average
Non-Athlete	7.61	0.94	Average
Total	7.63	0.93	Average

Table 5 presents the level of health-related physical fitness among junior high school students in flexibility. The overall level of flexibility ($\bar{x}=7.63$, $SD=0.93$) is interpreted as average. Both male ($\bar{x}=7.87$, $SD=0.92$) and female ($\bar{x}=7.36$, $SD=0.88$) students, as well as athletes ($\bar{x}=7.73$, $SD=0.93$) and non-athletes ($\bar{x}=7.61$, $SD=0.94$), demonstrate average levels of flexibility. These findings align with Chaouachi et al. (2014), who emphasized the need for flexibility training in physical education programs to prevent injuries and enhance physical performance. The minor variations between sexes and lifestyles suggest that while all groups maintain adequate flexibility, there may be slight differences in the types of activities they engage in, which can influence flexibility levels. The average levels of flexibility indicate that current physical education programs effectively maintain flexibility among junior high school students, though there is room for improvement to reach higher flexibility levels.

Differences in the Level of Health-Related Physical Fitness Among Junior High School Students

Table 6 presents the results of the t-test for Independent Samples, examining differences in health-related physical fitness components among junior high school students when grouped by sex. The analysis reveals significant differences in cardiovascular endurance, muscular strength, muscular endurance, and flexibility between male and female students, while body composition shows no significant difference. In cardiovascular endurance, the result ($t=5.72$, $p=0.000$) indicates that male students significantly outperform female students, suggesting better cardiovascular fitness among males. This difference may be attributed to variations in physical activity levels, types of exercises performed, or inherent physiological differences (Telama et al., 2014). Similarly, female students exhibit significantly higher levels of muscular strength than male students ($t=-11.43$, $p=0.000$). This result contrasts with common expectations and warrants further investigation into factors such as training routines and physical activity preferences (Agarwal & Arora, 2020). The analysis of muscular endurance shows that male students have significantly higher endurance ($t=10.28$, $p=0.000$) than female students, potentially due to greater participation in endurance-building activities or physiological differences (Dahab & McCambridge, 2009).

Conversely, body composition does not differ significantly between sexes ($t=1.40$, $p=0.163$), indicating similar levels of body fat and lean mass distribution among male and female students (Sallis et al., 2016). Male students demonstrate significantly higher flexibility than female students ($t=3.59$, $p=0.000$), which may be influenced by the types of physical activities they engage in (Chaouachi et al., 2014). These findings suggest that sex plays a crucial role in several aspects of physical fitness, highlighting the need for sex-specific considerations in physical education programs to address particular fitness components and promote overall health and well-being among students.

Table 6. Differences in the Level of Health-Related Physical Fitness Among Junior High School Students When Grouped by Sex

Components	F	Sig.	t	df	p-value	Decision	Significance at $\alpha = 0.05$
Cardiovascular Endurance	1.005	0.317	5.72	158	0.000	Reject Ho	Significant
Muscular Strength	1.278	0.260	-11.43	158	0.000	Reject Ho	Significant
Muscular Endurance	1.918	0.168	10.28	158	0.000	Reject Ho	Significant
Body Composition	0.686	0.409	1.40	158	0.163	Fail to Reject Ho	Not Significant
Flexibility	0.228	0.633	3.59	158	0.000	Reject Ho	Significant

Table 7 presents the results of the t-test for Independent Samples, examining the differences in health-related physical fitness components among junior high school students when grouped by lifestyle (athletes vs. non-athletes). The analysis reveals significant differences in muscular strength and body composition between athletes and non-athletes, while cardiovascular endurance, muscular endurance, and flexibility show no significant differences. In cardiovascular endurance, the result ($t=-1.53$, $p=0.128$) indicates no significant difference between athletes and non-athletes, as the p-value is greater than the alpha level of 0.05. This finding suggests that both groups have similar levels of cardiovascular fitness. Similarly, the result for muscular endurance ($t=-1.307$, $p=0.193$) shows no significant difference between the two groups, indicating comparable endurance levels. Conversely, in muscular strength, the result ($t=2.94$, $p=0.004$) reveals a significant difference, with athletes demonstrating higher muscular strength than non-athletes. This finding aligns with expectations, as athletes typically engage in regular strength training and physical activities that enhance muscle strength (Agarwal & Arora, 2020).

Additionally, body composition shows a significant difference between athletes and non-athletes ($t=-5.21$, $p=0.000$), with athletes having a leaner body composition, which can be attributed to their more active lifestyle and structured training regimens (Sallis et al., 2016). Regarding flexibility, the result ($t=0.811$, $p=0.418$) indicates no significant difference between athletes and non-athletes, suggesting similar levels of flexibility in both groups. This finding may reflect the general inclusion of flexibility exercises in physical education programs for all students, regardless of athletic involvement (Chaouachi et al., 2014). The findings highlight the impact of lifestyle on specific components of physical fitness. While cardiovascular endurance, muscular endurance, and flexibility are not significantly different between athletes and non-athletes, the advantages in muscular strength and body composition for athletes underscore the benefits of regular, structured physical activity. These results suggest that promoting athletic participation and structured

physical activities can enhance certain aspects of physical fitness, particularly muscular strength and body composition, among junior high school students.

Table 7. *Differences in the Level of Health-Related Physical Fitness Among Junior High School Students When Grouped by Lifestyle*

Components	F	Sig.	t	df	p-value	Decision		Significance at $\alpha = 0.05$
Cardiovascular Endurance	0.037	0.847	-1.53	158	0.128	Fail to Reject Ho	Not Significant	
Muscular Strength	0.091	0.763	2.94	158	0.004	Reject Ho	Significant	
Muscular Endurance	1.173	0.280	-	158	0.193	Fail to Reject Ho	Not Significant	
			1.307					
Body Composition	0.631	0.058	-5.21	158	0.000	Reject Ho	Significant	
Flexibility	0.036	0.850	0.811	158	0.418	Fail to Reject Ho	Not Significant	

Development of Fitness Program for Junior High School Students

Based on the salient findings, a comprehensive fitness program can be developed to enhance specific areas of physical fitness while maintaining current strengths. To improve cardiovascular endurance, the program should include regular aerobic activities such as running, cycling, and swimming, aligning with Telama et al. (2014) and Lacasan and Lacasan-Nagba (2023). However, the consistently high cardiovascular endurance across groups suggests that further research is needed to explore external factors like extracurricular activities and diet.

For muscular strength, incorporating resistance training, weight lifting, and body-weight exercises is recommended, especially for male students who showed lower strength levels than females, as suggested by Agarwal (2020) and Dahab and McCambridge (2009). This unexpected result warrants further investigation into activity preferences and support for strength training among different sexes. On the other hand, to boost muscular endurance, activities like circuit training and repetitive lifting with lighter weights should be included (Dahab & McCambridge, 2009). The average levels of muscular endurance indicate that current programs might not adequately target this component, suggesting a need for more focused endurance training.

Flexibility exercises, including daily stretching routines, yoga, and Pilates, should be integrated to improve flexibility (Chaouachi et al., 2014). The average flexibility levels suggest that while programs include flexibility exercises, they might need to be more intensive or frequent. Additionally, providing nutritional guidance on balanced diets and regular physical activity will help students maintain or improve their body composition, as Sallis et al. (2016) emphasized. The normal body composition across all groups indicates effective current programs, but slight variations between athletes and non-athletes highlight the benefits of structured training.

This comprehensive approach aligns with global and regional recommendations for school-based physical fitness interventions (Rengasamy, 2012; Cagas et al., 2022). However, the study's limitations, such as the lack of detailed data on physical activities and overall lifestyle outside school, should be addressed in future research. This will provide a more holistic understanding and offer more targeted recommendations for improving health-related fitness in junior high school students.

Conclusions

This study assessed the health-related physical fitness among junior high school students, focusing on cardiovascular endurance, muscular strength, muscular endurance, body composition, and flexibility, grouped by sex and lifestyle (athlete vs. non-athlete). The findings revealed that both male and female students, as well as athletes and non-athletes, exhibited high cardiovascular endurance, indicating a general capacity for sustained aerobic activities among the students. Female students showed significantly higher muscular strength compared to male students, while both athletes and non-athletes demonstrated very high levels of muscular strength, with athletes having a slight edge. All groups maintained average levels of muscular endurance, suggesting the need for targeted endurance training. Both athletes and non-athletes maintained normal body composition, with athletes having a leaner profile. Additionally, both sexes and lifestyle groups displayed average flexibility levels, indicating room for improvement in this area.

Notable differences in physical fitness components were observed between sexes, with females exhibiting higher muscular strength and males showing better cardiovascular endurance and muscular endurance. Athletes exhibited higher muscular strength and leaner body composition than non-athletes, underscoring the benefits of regular, structured physical activity. To address these findings, a comprehensive fitness program should be developed. This program should include regular aerobic activities such as running, cycling, and swimming to maintain and enhance high cardiovascular endurance. Strength training, particularly for male students, should be implemented through resistance training and body-weight exercises to improve muscular strength. Endurance activities such as circuit training and repetitive lifting exercises should be incorporated to boost muscular endurance. Flexibility exercises, including daily stretching routines and yoga, should be integrated to enhance flexibility. Additionally, promoting balanced diets and regular physical activity may help maintain healthy body composition.

By addressing the specific needs identified in this study, educators may develop a comprehensive and inclusive physical education

program that fosters a culture of health and wellness. This program may equip junior high school students with the physical capabilities and habits that may benefit them throughout their lives. Such a holistic approach ensures that physical education curriculum cater to the diverse fitness requirements of all students, thereby promoting lifelong fitness and health.

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